Subject Index

Bioremediation, 181

Biosafety, 108

ABC, See Association of Biotechnology Companies Absorbents for color removal, 188 ABSP, See Agricultural Biotechnology for Sustainable Productivity Abstract journals, 129 Abstracts, 165-166 Africa, biotechnology development in, 204-213 Agency for International Development (USAID), 109 Agricultural biotechnology, World Bank support for, 74-75 Agricultural Biotechnology for Sustainable Productivity (ABSP), 102-110 Agricultural competitiveness, 114-116 Agricultural productivity in fragile lands, 116 Agricultural research, 85-86 Agriculture and biotechnology in developing countries, 80-92 Agriculture complexity of, 53 model systems in, 55-57 novel methods in, 54 problem transfer, 54 Agrobiotechnology in developing world, 111-126 AMINOMAT, 40-41 Antidisease vaccines in malaria, 8 Antigenic diversity in malaria, 8 Antigens as targets of immunity in malaria, 11 Apomixis, 63-67 Appropriate technology, issue of, 90

Biosafety regulation, 124, 220 advocacy groups, 223-225 application sector, 223-225 company size, 223-225 human, material, and budgetary resources, public acceptance, 223-225 regulatory policies and politics, 221-223 risk assessment, 220-221 socioeconomic impact, 223-225 timing and direction of innovation, 223-225 Biotechnology, 165-172, 232-255 and agriculture in developing countries. 80-92 cooperation, 43-44 development strategy in developing countries, 122 for developing countries, 194-202 industry, 112-114 information, 135-144 networks, 135-144 obstacles to commercialization, 214-231 R&D in developing countries, 153-158 research, public and private partnership, 93-99 supply and demand issues, 89-90 support policies in Latin America, 121transfer, plant, 93-99 transfer to developing countries, 22-30 BIOTRACK, 175-176 Bose Institute, 240, 246-248 Brain drain, 195 BVI, See Biesenthal Vaccine Initiative

Baculovirus vector, 28
Barriers to technology transfer, 233–235
Biesenthal Vaccine Initiative (BVI), 47, 49–52
Bio/Afrique, 204–213
BIOCAT, 176
Biochemical model of agricultural production, 82
Biodiversity, 67, 117
Bioindicators, 61
Bioinformatics, 135–144, 145–152, 159–164
BioLink, 109
Biological data, management of, 153–158
Biological databank development, 155–158
Biological weapons, 43–47
Biological Weapons Convention, 43–47

Asexual blood stage vaccines in malaria,

research team, 105-106

Association of Biotechnology Companies, 109

CAB International in information dissemination, 165–172
CAL, See Computer-assisted learning
CAMBIA, See Center for the Application of Molecular Biology to International Agriculture
Cameroun, 204
Capability-building by developing countries, 236–237
Capitalization, 210
Caribbean, research and development in, 117–122
CD-ROM, 166–167
Cell and Molecular Biology Research Center,

198-200

Subject Index

Bioremediation, 181

Biosafety, 108

ABC, See Association of Biotechnology Companies Absorbents for color removal, 188 ABSP, See Agricultural Biotechnology for Sustainable Productivity Abstract journals, 129 Abstracts, 165-166 Africa, biotechnology development in, 204-213 Agency for International Development (USAID), 109 Agricultural biotechnology, World Bank support for, 74-75 Agricultural Biotechnology for Sustainable Productivity (ABSP), 102-110 Agricultural competitiveness, 114-116 Agricultural productivity in fragile lands, 116 Agricultural research, 85-86 Agriculture and biotechnology in developing countries, 80-92 Agriculture complexity of, 53 model systems in, 55-57 novel methods in, 54 problem transfer, 54 Agrobiotechnology in developing world, 111-126 AMINOMAT, 40-41 Antidisease vaccines in malaria, 8 Antigenic diversity in malaria, 8 Antigens as targets of immunity in malaria, 11 Apomixis, 63-67 Appropriate technology, issue of, 90

Biosafety regulation, 124, 220 advocacy groups, 223-225 application sector, 223-225 company size, 223-225 human, material, and budgetary resources, public acceptance, 223-225 regulatory policies and politics, 221-223 risk assessment, 220-221 socioeconomic impact, 223-225 timing and direction of innovation, 223-225 Biotechnology, 165-172, 232-255 and agriculture in developing countries. 80-92 cooperation, 43-44 development strategy in developing countries, 122 for developing countries, 194-202 industry, 112-114 information, 135-144 networks, 135-144 obstacles to commercialization, 214-231 R&D in developing countries, 153-158 research, public and private partnership, 93-99 supply and demand issues, 89-90 support policies in Latin America, 121transfer, plant, 93-99 transfer to developing countries, 22-30 BIOTRACK, 175-176 Bose Institute, 240, 246-248 Brain drain, 195 BVI, See Biesenthal Vaccine Initiative

Baculovirus vector, 28
Barriers to technology transfer, 233–235
Biesenthal Vaccine Initiative (BVI), 47, 49–52
Bio/Afrique, 204–213
BIOCAT, 176
Biochemical model of agricultural production, 82
Biodiversity, 67, 117
Bioindicators, 61
Bioinformatics, 135–144, 145–152, 159–164
BioLink, 109
Biological data, management of, 153–158
Biological databank development, 155–158
Biological weapons, 43–47
Biological Weapons Convention, 43–47

Asexual blood stage vaccines in malaria,

research team, 105-106

Association of Biotechnology Companies, 109

CAB International in information dissemination, 165–172
CAL, See Computer-assisted learning
CAMBIA, See Center for the Application of Molecular Biology to International Agriculture
Cameroun, 204
Capability-building by developing countries, 236–237
Capitalization, 210
Caribbean, research and development in, 117–122
CD-ROM, 166–167
Cell and Molecular Biology Research Center,

198-200

Center for the Application of Molecular Biology to International Agriculture, 68 Central Research Institute for Food Crops, Children's Vaccine Initiative, 1-6 Chimeric genes, 28 China, 167 Chiron Corp., 204 CIBCM, See Cell and Molecular Biology Research Center Circumsporozoite protein (CSP) in malaria vaccine, 9-10 Cloning, 199 Color elimination from drinking water, 188 Combinatorial libraries, 39-40 Commercial biotechnology development in Africa, 204-213 Commercialization of MEOR, 187-188 obstacles to, 214-231 Competition in Latin America, 114

Competitiveness, 226–228
Computer literacy, 138–139
Computer-assisted learning (CAL) authorware, 180
copyright transportability, 179
courseware, 178–179
guide, 180
video disk, 179
Computer user education, 141

Concept development, 233

CONICIT, 196-197

Conservation, 197-198

Contaminants, 200
Core Database in Biotechnology, 147
CRIFC, See Central Research Institute for Food Crops
Crop protection, 169–171
Current Contents, 145
Cycles of selection, 38

Cytotoxic immunity in rotavirus infection, 33

Computer user interactive processes, 157

Data acquisition, 157
Data elements, identification of, 156–157
Databanks, 202
Databases, 136–138, 153, 165–166, 175–176
Developmental procedures, identification of, 156
Diagnostic kits, rapid, 22–30
Diagnostics, 170
DNA plant technology, 107
Drinking water regulations, 188–192
Drugs, new, 36–41
Dual-threat agents, 43–45
Dualla, Cameroun, 212

Economic factors in oil production, 185
Electronic compendium, 169–171
Electronic information, 130–131
Electronic mail, 196
Engineered plants, 66
Environmental degradation, 201
Environmental dependence, 55
Environmental pollution, 181
Environmental reporters, 61
Epidermal growth factor, 211
Evaluation procedures, 158
Evolution in vitro, 37–38
Expression vector, cold-adapted, 34

Farmer control of engineered plants, 66 Field trials, organization and design of, 185–186 Forestry, 169

Gene structure, 58 Genetic engineering, 181 Global competitiveness, 214 GUS system, 59

Hazardous compounds, 181
Hemagglutinin and fusion proteins, 25–28
Hepatitis B, 211
Home pregnancy tests, 206
Human chorionic gonadotropin (hCG), 209
Human genetics, 198
Human immunodeficiency virus, 27–28
Human resource development, 108
Humoral immunity in rotavirus infection, 33
Hybridoma, 208

AEA, See International Atomic Energy IBI. See Initiative for Biotechnology Implementation ICGEB, See International Centre for Genetic Engineering and Biotechnology ICI Seeds Americas, 107 IDB, See InterAmerican Development Bank ILDIS, See International Legume Database and Information Service Immunity, acquisition of, in malaria, 8 Immunization in malaria, 8 Immunoassay, 209 In vivo reporters, 59 INBio, 197 India, plant biotechnology project in, 239-253 Industry without research, 235

Information Resource for the Release of Organisms into the Environment, 173–176

Information, 145-152

access, 140

in developing countries, 78

costs, 140-141 explosion, 136-138

explosion, 136–138 literacy, 138–139

policies, 144

production, 139

representation, 140

retrieval systems, 141 scientific, growth of, 128-134

technology, 165–172

users, 138-139

variety, 139

Initiative for Biotechnology Implementation (IBI), 204

Institutional innovation, 91

Intellectual property issues, 125

Intellectual property management, 77

Intellectual property rights, 108, 225-226 InterAmerican Development Bank, 200

Interfaces, 142

Interferon, 28 Interleukin-2, 211

International agricultural research centers, 123-124

International Atomic Energy Agency (IAEA), 200

International Centre for Genetic Engineering and Biotechnology (ICGEB), 44

International Finance Corp. (IFC), 206, 212–213

International Legume Database and Information Service (ILDIS), 159–164

Internet, 137-138

Investment in developing countries, 123

IRRO, See Information Resource for Release of Organisms into the Environment

Secretariat, 174 ISAAA, 93-101

Jennerian approach to rotavirus vaccination, 33–34

Knowledge base, 233

LAC system, 59 Latin America biotechnology in, 194–202 research and development in, 117–122 Less developed countries, 228–229 Libraries and information centers, 143 Libraries for research, 129–130 Libraries on beads, 38

Vacromicro linkages, 88 Maize technology, 82 Malaria, 7-14, 206 infection transmitted by, 8 merozoites in, 8 ookinetes in, 8 schizont in, 8 sporozoites in, 8, 9 vaccines, 7-14 Male sterility created using molecular technologies, 65 Marketing, 87 Medical defense of military, 46 MEDLINE, 153 MEOR history, 184 Merozoites in malaria, 8

Merozoites in malaria, 8 Microbial enhancement of oil recovery, 183–188

Microbial Network in Europe (MINE), 148 Microbial opportunities in oil production, 184 Microbial Strain Data Network (MSDN), 148, 173

Mimics of epitopes (MIMOTOPE), 39 MINE, See Microbial Network in Europe

Model systems, 53-73 Molecular biology, 196

Molecular biology technology in developing countries, 22–30

Molecular Genetic Resource Service, 69–70 Molecular technology, apomixis created through, 65

Monoclonal antibodies, 206-207

MSDN, See Microbial Strain Data Network Multimedia CAL (computer-assisted learning), 177–180

National strategies in biotechnology, 75 New England Biolabs, 204 Nitrocellulose, 209 Nitrogen fixation efficiency, 62 Nondestructive reporter genes, 57–61 North-South information inequities, 143 Nucleotide sequence libraries, 147–148

OECD, See Organization for Economic Cooperation and Development Oil production, economic factors in, 185 Oil reserves, 183 Ookinetes in malaria, 8
Organization for Economic Cooperation and
Development (OECD), 82–84, 113–114
Orphan commodities, 76
Orphan crops, 69
transformation of, 61

Parasitic diseases, vaccines against, 7-14 Patents, 200-201 Peptide design, 40-41 Peste-des-petits-ruminants virus, 25 Phage libraries, 36 Physiological reporters, 61 Pilot plants, 189-192 Plant biotechnology applications, transfer of, 93-99 Plant biotechnology project in India, 239-253 Plant virology, 198 Plasmodium falciparum, 7-8 Policy coherence, issue of, 91 Policy options in biotechnology in developing countries, 78 Pollution, environmental, 181 Polymerase chain reaction (PCR), 198 Poor science, 147 Privatization of seeds production and marketing, 86-87 Proliferation verification, 44-45

Quality control, 208

Kandom screening, 36 Recombinant vaccines for diseases in developing world, 22-30 Regulatory issues in releasing novel products, 77-78 Reovirus, 32-33 Reporter genes, 57-61 Research libraries in the North, 129-130 Residual oil, 183 Rinderpest, 25-28 Rockefeller Foundation, 132 Rotavirus vaccination, 32-35 Rotaviruses epidemiology, 32 pathophysiology, 32 virology, 32-33

Schizont in malaria, 8 Scientific, technological, and engineering bottlenecks, 215–216 Secreted reporter enzymes, 61 Seeds production, 86 Sentinel plants, 61–63
Simian immunodeficiency virus, 27–28
Smallpox, 23–24
Socioeconomic impact of new technologies, 75
Species diversity knowledge systems, 159–164
Sporozoite surface protein-2 (SSP2) in malaria vaccine, 10
Sporozoites in malaria, 8, 9
Structural adjustment programs in developing countries, 81
Subunit vaccine antigen, 7–8
Sustainable agricultural production processes, 116
Sustainable agriculture, 54–55
Systematic Evolution of Ligands by

Exponential enrichment (SELEX),

L cell in immune response in malaria, 10 Taxonomic databases, 160-161 Technological change in agriculture, 81 Technologies, new, 74-75 Technology assessment, 76-77 diffusion, 87 integration with management, 187 push, market pull, 182 transfer, 87-88, 182-193, 232-233, 249-250 transfer programs, 125 transfer to developing countries, 22-30 Third World, transferring technology to, 192 Threshold factors market creation, 219-220 market demand, 219-220 production scale-up, 218-219 R&D costs, 217-218 Tools adaptation of, 69 development, mechanisms for, 67-68 Toxin weapons, 43-47 Trade liberalization in agriculture, 80 Transmission-blocking vaccines in malaria, 13-14

UNDP, See United Nations Development Program UNEP, See United Nations Environmental Programme United Nations Development Program (UNDP), 232–233 project in India, 239–253 United Nations Environmental Programme

Tree biodiversity, 67

(UNEP), 173

Vaccines, 46–47
anti-malarial, 7–14
current limitations of, 1–2
potential for development of, 2–3
transmission-blocking, in malaria, 13–14
Vaccines for Peace (VFP), 46–47
Vaccinia virus, 23–28
Vectors, 24
viral, 45

Venture capital, 200 VFP, See Vaccines for Peace

Wastes, 201
Wellcome Trust, 179
WHO, See World Health Organization
World Bank policies and programs in
biotechnology, 74–79
World Health Organization (WHO), 204

Index of Contributors

Altman, D. W., 93-101

Bedford, B., 102–110 Bialy, H., 204–213 Bisby, F. A., 159–164 Brenner, C., 80–92

Cassani, G., 36–42 Chakrabarty, A. M., 181 Chambers, J., 102–110 Cohen, J., 102–110

Dodds, J., 102-110

Falaschi, A., ix-x Franklin, J., 145-152

Geissler, E., 43-52 Greenberg, H. B., 32-35

Hoider, A. A., 7-21 Howe, G., 177-180

Jaffé, W. R., 111–127 James, C., 93–101 Jefferson, R. A., 53–73

Kesselman, M., 135–144 Kirsop, B. H., 173–176 Léon, P. E., 194-203 Leopold, M., 214-231

Moses, V., 182-193

Persley, G. J., 74-79

Réchaussat, L. J., 153-158

Russell, P. K., 1-6

Saracevic, T., 135–144 Scott, P. R., 165–172 Sondahl, M., 102–110 Sticklen, M., 102–110

Trigo, E. J., 111–127 Tzotzos, G. T., ix-x

wilson, M., 102–110

Yilma, T., 22-31

Zilinskas, R. A., 232–255